



# **ON TRACK FOR THE FUTURE:**

**State—Amtrak—Federal  
Partnerships  
in High-Speed Ground  
Transportation**



**U.S. Department of Transportation  
Federal Railroad Administration**

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## All Aboard to the 21<sup>st</sup> Century

High-speed ground transportation (HSGT) comprises a family of transportation options that can, in some instances, expand the range of potential responses to long-term transport needs in heavily populated corridors. This paper describes partnerships between the States, Amtrak, freight railroads, and other entities to explore, and in some cases develop, HSGT opportunities. As directed by the High Speed Ground Transportation Act of 1965 and follow-on legislation, the Federal Railroad Administration (FRA) has been participating in certain of these partnerships. With the successful completion of the original phases of the Northeast Corridor (NEC) Transportation Project—including continuous electrification between Washington, New York, and Boston—the FRA’s attention in recent years has expanded beyond the NEC main line to address HSGT options in other corridors, on which this paper focuses.

## What is HSGT?

HSGT is self guided intercity passenger ground transportation that is time-competitive with air and/or autos on a door-to-door basis for trips in the approximate range of 100 to 500 miles. This is a market-based, not a speed-based definition: it recognizes that the opportunities and requirements for HSGT differ markedly among different pairs of cities.

A corridor is a natural grouping of metropolitan areas and markets that, by their proximity and configuration, lend themselves to efficient service by ground transport.

## **Potential Benefits of HSGT**

Supporters of HSGT point to the long-term growth in America's population, income, travel demand, and congestion in intercity transportation by air and auto. According to this view, the traditional remedies—expansion of airports and highways—have involved increasing environmental and dollar costs and public hesitation in the affected communities. HSGT, its proponents assert, can offer such social, economic, and environmental benefits as energy savings, emission reductions, and maximized use of existing facilities. A full exposition of this line of reasoning appears in FRA's 1997 report, *High-Speed Ground Transportation for America* (available at <http://www.fra.dot.gov/doc/hsgt/cfs/index.htm>). Since that report was published, the events of September 11, 2001 have (a) somewhat mitigated the growth trends in air traffic congestion and (b) emphasized to some observers the possibility that HSGT (together with other passenger rail services) might function as an alternative mode of quality public transportation in the event of future dislocations in the air and highway networks, as well as under more normal circumstances.

## **HSGT Technologies**

Several HSGT technologies are available:

*Incremental high-speed rail (HSR)* is a term used to describe the modernization of intercity rail passenger service on existing railroad rights-of-way. In most corridors, Incremental HSR would rely on the cooperation of the freight railroads which own the tracks. One example of the kinds of partnerships that support the development of incremental HSR technologies is that between the State of North Carolina and the Norfolk Southern Railway on the Southeast Corridor segment between Charlotte and Raleigh, where a comprehensive and innovative highway/rail grade crossing safety improvement program has occurred.

*New HSR* comprises advanced steel wheel passenger trains that run primarily on new rights-of-way. Through a combination of technologies, these new trains can travel at speeds up to 200 mph. They are also able to operate on existing track, so that they can also make use of

existing approaches to urban terminals. Successful examples of New HSR include the French TGV, the Japanese Shinkansen, and the German InterCity Express.

*Magnetic levitation (Maglev)* transportation systems utilize vehicles that float above specially-designed guideways, supported by magnetic fields. Maglev demonstration projects in Germany and Japan have routinely carried passengers at speeds of up to 300 mph. As yet, there are no intercity Maglev systems in revenue service, although China is constructing a 30 km line that is expected to be operational in 2003 between the airport in Shanghai and the nearest subway stop.

Pursuant to the Maglev Technology Deployment Program contained in Section 1218 of TEA-21 (Public Law 105-178, dated June 9, 1998), the Department of Transportation selected two projects, in Maryland<sup>1</sup> and Pennsylvania, to continue to the next stage of the program. A Final Programmatic Environmental Impact Statement was published and distributed on April 20, 2001 that identified the Maryland and Pennsylvania projects for continued evaluation and possible project development. Of these two active proposals, Section 1218 of TEA-21 provides for selection of a single project for implementation, which can only occur if the Congress actually appropriates for that purpose the \$950 million authorized by the legislation.

## **The Federal Railroad Administration**

The FRA is an agency of the Department of Transportation. It was created in 1966 to promote and enforce railroad safety throughout the United States, rehabilitate the Northeast Corridor rail passenger services, consolidate Federal support for rail transportation and support research and development of new technologies.

FRA disseminates information and provides grants for high speed rail development when authorized. FRA works in partnership with Amtrak, freight railroads of all sizes, State and local governments, shippers, passengers, employees and their unions, manufacturers, suppliers, Congress and the public to ensure that we all enjoy a safe, efficient, and reliable system of rail transportation—both freight and passenger.

## **FRA's Next-Generation High-Speed Rail Technology Development Program**

The objective of the Next-Generation Program is to support the availability of modern, cost-effective Incremental HSR technology on existing infrastructure. The intent is to lower initial HSGT investment requirements to the range of \$2 million to \$3 million per mile.

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<sup>1</sup>The Maryland project would also serve the District of Columbia.

The Next-Generation program is based on partnerships with suppliers of technology, railroads, and State governments. By working with State and railroad partners FRA will be providing a real-world environment for the application of these technologies, preparing the way for a smooth introduction at such time as the States may be ready to implement their systems.

Where advantageous, the program makes use of technology developed originally for defense applications, such as the Global Positioning System (GPS) satellites for automatic train location and high strength lightweight materials to reduce train weight and improve performance.

FRA has identified four program areas where development and demonstration activities have a high potential return on investment when Incremental HSR programs are implemented:

- C Advanced Train Control Systems would maximize—at considerably lower cost than that for conventional railroad signal and control systems—the capacity of railroads to carry safely a mix of high speed passenger, commuter, and freight trains. FRA has awarded grants for two major demonstration projects: between Detroit and Chicago, and between St. Louis and Chicago. Amtrak and the freight railroads are heavily involved in these projects,
- C Non-Electric Locomotives are intended to achieve the speed and acceleration capability of electric trains without the expensive infrastructure of railroad electrification. FRA, in a project with the Bombardier Corporation, has built and is beginning to test a new 5,000 horsepower locomotive for high-speed and regular passenger service. FRA, New York State, and Amtrak have been working together to remanufacture and test a series of high-speed turbine locomotives along the *Empire Corridor* between New York and Albany. Meanwhile, also for FRA, the University of Texas is developing a flywheel energy storage system that can be used in lightweight, high-speed locomotives.
- C Grade Crossing Improvement efforts are intended to significantly enhance safety at highway-railroad grade crossings at a relatively low cost. These efforts address technologies—such as barrier systems and innovative warning and traffic control devices—that can reduce hazards at individual crossings, as well as corridor-wide approaches for grade crossing safety. Thus, as part of this initiative, FRA is working with North Carolina on its “sealed corridor concept” to minimize grade crossing risks on the line between Raleigh and Charlotte. FRA is also supporting new planning techniques that would better enable States to prioritize investments at grade crossings so as to minimize risks to motorists and train occupants alike.

- C Track and Structures programs aim to assess and maximize the throughput capacity of existing corridors and to improve the ride quality of high-speed passenger rail at minimal cost.

## **Designated HSR Corridors**

As of January 2002, the FRA has designated ten high-speed corridors under section 1010 of the Intermodal Surface Transportation Act of 1991 (ISTEA) and Section 1103(c) of the Transportation Efficiency Act for the 21<sup>st</sup> Century (TEA-21). Designation allows a corridor to receive specially targeted funding for highway-rail grade crossing safety improvements, and recognizes the corridor as a potential center of HSR activity. These designated corridors are shown on Map 1 (on the inside front cover of this document) and listed below, generally from west to east.

- \$ the Pacific Northwest;
- \$ California;
- \$ the South Central Corridor (San Antonio, TX-Dallas-Little Rock, AR; and Fort Worth, TX to Tulsa, OK.)
- \$ the Chicago Hub Network (Chicago to Detroit, St. Louis, Milwaukee/Twin Cities, and Indianapolis/Cincinnati);
- \$ the Gulf Coast Corridor (Houston, TX-New Orleans, LA-Mississippi Gulf Coast points-Mobile, AL and New Orleans-Birmingham, AL);
- \$ the Southeast Corridor (Washington, DC-Richmond/Newport News, VA-Raleigh, NC-Charlotte, NC/Atlanta, GA/Macon, GA; and Columbia, SC/Savannah, GA/Jacksonville, FL);
- \$ Florida;
- \$ the Keystone Corridor (Philadelphia-Pittsburgh, PA);
- \$ the Empire Corridor (New York City-Albany-Buffalo region, NY); and

\$ the Northern New England Corridor.

### **Activities in the Designated Corridors—Emphasis on Incremental HSR**

The following sections discuss typical activities by the States and their partners in the Designated Corridors, with emphasis on Incremental HSR initiatives. In the interest of conciseness, not all States or corridors receive exhaustive treatment.

#### **Pacific Northwest Corridor (Washington State and Oregon)**

*Accomplishments and Status.* Washington State took delivery of two custom built TALGO trains in late 1998 for use in the Eugene, Portland, to Seattle corridor and Amtrak began service in January 1999. Amtrak purchased two similar TALGO trains which operate between Seattle and Vancouver, BC, and provide a second daily round trip between Seattle and Bellingham, WA. Oregon leased a fifth Talgo train for service between Eugene and Portland, OR and Seattle.

In 1996 voters in the three metropolitan counties on the east side of Puget Sound approved the creation of a new regional transit agency, known as Sound Transit and provided local tax support for a multifaceted approach to meeting regional needs. Enhanced regional express bus service, light rail in Seattle and Tacoma and an 82 mile commuter rail line now link three counties between Everett and Lakewood, WA. Seattle-Everett environmental reviews have been completed and final engineering is underway. Several expansion projects in the Seattle-Tacoma area are underway.

Oregon has been collaborating with Washington State, Amtrak, and the freight railroads in upgrading service and facilities on the Pacific Northwest Corridor. For example, grants under the planning and preconstruction activities and Next Generation High-Speed Rail portions of the Swift Rail Act have funded signal and track work in the vicinity of Portland's Union Station, in order to improve travel times and capacity.


*Outlook.* Seattle's King Street Station is being refurbished and construction of a train maintenance facility in Seattle is underway. Other station improvements are underway along the route. Voter-approved reductions in transportation taxes have necessitated a readjustment of Washington State's investment plans; trackage and facilities that are used by Sound Transit on the Seattle-Tacoma and Seattle-Everett portions will receive some \$82 million of needed improvements. Funding for other portions of the line are being sought.



Oregon will continue its Amtrak services throughout the coming year but no service expansion is planned at this time.

## **California Corridor**

*Accomplishments and Status.* Since the 1980s, the State of California has been making significant investments, in conjunction with Amtrak, the local governments, and the railroads, in equipment and facilities for the existing California corridor—the main lines linking the Bay Area, Los Angeles, and San Diego, as well as connecting routes to Sacramento. These lines serve 90% of the State's population and support multiple uses, including intercity and commuter trains. However, the existing passenger routes still pose substantial challenges to the achievement of high speed rail service, as exemplified by the lack of a speedy passenger rail route between Los Angeles and Bakersfield in the Central Valley, and the 600 at-grade highway crossings remaining on California's main passenger lines.

 In regard to grade crossings, the State has received a total of \$6.1 million under the FRA/FHWA Grade Crossing Hazard Elimination program for high-speed routes, to close redundant crossings and provide upgrades at the remaining public and private crossings in the corridor. The California Department of Transportation (Caltrans) and FRA are cooperating in a project to apply risk management techniques to the San Joaquin route to most effectively reduce grade crossing hazards by best targeting of available resources. A draft is in review and the final report is expected by mid-2002.

In an effort to overcome the other challenges and achieve high-speed rail quickly, the California High Speed Rail Authority (Authority) has been charged with developing a plan for the financing, construction and operation of a high-speed train network for the State capable of achieving speeds of at least 200 mph, consistent with the *High-Speed Rail Summary Report and Action Plan* prepared by the Authority's predecessor organization known as the California Intercity High-Speed Rail Commission.

The Authority released the draft business plan to the Governor and legislature. The draft plan recommends that the State modify its strategy for implementing high-speed rail in California by deferring a public vote on the project until a program environmental impact report is completed and public comments are received.

*Outlook.* Irrespective of the outcome of the effort to develop a new system for California, the State and Amtrak have formed a partnership to plan and undertake improvements on the State's conventional passenger railroads. These important routes will offer incrementally upgraded Amtrak service while serving as vital feeder lines in the event the larger, Authority-sponsored project reaches fruition. Some \$91 million from the Public Transportation account is



being spent on three large projects and an additional \$95 million is in the State Transportation Improvement Program for rail projects. Services benefitting from the California/Amtrak partnership include:

- \$ The *Pacific Surfliners* (between San Diego, Los Angeles, and Coast Line points, currently as far north as San Luis Obispo);
- \$ The *San Joaquins* (between the Bay Area, Sacramento, and Central Valley points); and
- \$ The *Capitols* (San Jose, Oakland, Sacramento, and Roseville).

Some of these services already operate at up to 90 mph on track of the former Santa Fe Railway. There is a proposal to test higher speeds on a segment between Los Angeles and San Diego.

### **Chicago Hub Network— Midwest Regional Rail Initiative**

In August 1998, nine Midwestern states, led by the Wisconsin Department of Transportation, released a blueprint/business plan for preserving, improving and expanding rail passenger services (including high-speed rail) within the Midwest region. The study sponsors included the States of Illinois, Iowa, Michigan, Missouri, Wisconsin, Minnesota, Indiana, Nebraska, and Ohio, as well as Amtrak. Partial funding was provided by the FRA.

The study report results indicated that a regional rail system, centered in Chicago and operating as a hub-and-spoke system over existing trackage, would be feasible. The study projected that the system would have a benefit to cost ratio of 1.8, have an overall revenue to cost ratio of 1.36 or cover its operating costs and recover the State share of capital costs. The system would operate at speeds up to 110 mph. Capital costs for the entire system (consisting of seven major spokes, some of which subdivide at a distance from Chicago to serve multiple endpoints) were estimated at \$3.5 billion over the six years required to rebuild current trackage. The system would provide a service that could compete with other modes based on its much-improved travel times, frequencies and fares. It would also be comparable to air in comfort and convenience for medium-distance trips.

In March 2000, the Initiative's consultants completed a draft report updating the 1998 plan. The States are now seeking project endorsement and funding commitments to advance project planning and implementation. Ongoing projects in Illinois and Michigan, and planned routes in Wisconsin and Minnesota, as well as other lines, would be part of the larger Midwest Regional Rail Initiative. In particular, most of the designated spokes of the Chicago Hub Network (see map, inside front cover) would form integral parts of the larger Midwest Regional Rail Initiative.

As a promise of tangible progress for the Midwest Regional Rail Initiative, Amtrak, working with the States, has made plans to acquire equipment to be used in high-speed service, with up to 20 trainsets to be ordered initially.

### **Illinois (Chicago Hub Network: Chicago–St. Louis spoke)**

*Accomplishments and Status.* Illinois has made noteworthy investments in the designated Chicago–St. Louis spoke of the Chicago Hub Network. Positive train control, grade crossing improvements, and route rationalization in the St. Louis/East St. Louis area have been prominent among these investments; progress has also been made in the environmental work for the route.

Illinois is one of three partners, with FRA and all of the major freight railroads represented by the Association of American Railroads (AAR), in a joint program for a Positive Train Control system demonstration on a portion of the Chicago - St. Louis corridor. Under FRA's Next Generation High-Speed Rail Program, grants totaling \$28 million will have been made to Illinois through Fiscal Year 2002, to be matched with about \$12 million in state funds and \$20 million of railroad industry contributions. The total project cost is estimated at about \$60 million.

The program is addressing major positive train control system interoperability issues among the various railroads, as well as installing a demonstration system on the Illinois corridor segment. The demonstration system will use differential Global Positioning Systems (DGPS) aboard locomotives, digital radio and advanced computers to monitor the location of trains in the rail system and oversee operation by locomotive engineers to prevent collisions and overspeed derailments. The system on the Chicago-St. Louis corridor will be controlled from Union Pacific's Harriman Dispatch Center in Omaha.

A contract award was made by Illinois DOT to the Association of American Railroads Transportation Technology Center, Inc. for joint program management on January 8, 1999. A competition selected ARINC, Inc., of Annapolis, MD, for a \$4.2 million contract to serve as Systems Engineers for the four year effort. A second competition selected Lockheed Martin for a \$34 million system design and integration contract.

With respect to grade crossing safety, about \$950,000 of Section 1103(c) funding was allocated to Illinois for grade crossing safety enhancements in this corridor.

The State received a \$3 million grant from FRA, for a project to eliminate the "bottleneck" that exists in approaching the passenger terminal in St. Louis. The Federal funds

were matched by \$750,000 of State funds. The project rehabilitated 6 miles of track and the signal system between Granite City and East St. Louis, IL on the Union Pacific (UP) right-of-way, so as to remove passenger trains from the heavily traveled freight lines and move them southward over renovated tracks to the MacArthur Bridge. These improvements are complete and some 15 minutes of running time have been removed from the schedule.

The State of Illinois is preparing an environmental impact statement (EIS) for the Dwight to St. Louis portion of the corridor. A preliminary EIS was provided to the FRA and that work is under review.

*Outlook.* The “Illinois First” initiative provided some \$100 million of rail projects of which \$70 million was targeted for the Chicago to St. Louis high speed rail corridor. Extensive rehabilitation work has begun on the Joliet to Springfield portion by the Union Pacific crews to bring the track up to Class 6 standards, preparing for speeds of up to 110 mph.

Illinois Department of Transportation (IDOT), together with Amtrak, has developed a plan for non-electric services, with tilt suspension technology and top speeds primarily at 110 mph. The State’s proposed system would offer eight round trips per day between Chicago and St. Louis with downtown to downtown trip times of 3 to 3.5 hours for a two hour time savings. State-estimated capital costs for the Chicago–St. Louis spoke are in the \$400 million range, including grade crossing hazard elimination costs. Current lines would be upgraded over a three year period.

### **Michigan (Chicago Hub Network: Chicago–Detroit spoke)**

*Accomplishments and Status.* The State of Michigan and Amtrak have been making improvements in track, signals, stations, and equipment to incrementally upgrade the Chicago to Detroit designated high-speed corridor. Amtrak owns about one-third of the line and Norfolk Southern (as successor to Conrail) owns the remaining two thirds.

Since 1995, Michigan has received grants from FRA's Next Generation High-Speed Rail Program to install and demonstrate an advanced communications-based train control system on a 70-mile segment of the Amtrak-owned portion of the corridor between Kalamazoo, Michigan and the Indiana State line. The State and Amtrak have matched the Federal funds with funding to upgrade the track for Class 6 (110 mph) operation and with fencing and station improvements. The State and Amtrak have been very active in closing grade crossings as well to support the high-speed initiative. The Incremental Train Control System being developed by General Electric Transportation Systems Global Signaling has been in 100 mph test operation on an initial 20-mile section. Wayside hardware installation is nearing completion on the entire 70-mile segment. Revenue high-speed service at 90 mph began on January 7, 2002.

**Outlook.** In early January, 2002, FRA approved 90 mph operations on some 40 miles of Amtrak's Detroit to Chicago route. This speed increase is a direct result of an effort between the state and Amtrak to implement a three-phase, 32-segment plan for improvements from Chicago to Detroit. Amtrak service on the 279-mile line now takes about five and one-half hours and the highway trip takes about five hours. By the end of the project, Michigan plans ten round trip frequencies, using 110 mph locomotives and a running time of about three and one half hours. The State-estimated capital costs for the upgrades for non-electric service including property acquisition are about \$700 million.

### **Wisconsin and Minnesota (Chicago Hub Network: Chicago–Milwaukee–Twin Cities spoke)**

*Accomplishments and Status.* In addition to the studies undertaken as part of the Midwest Regional Rail Initiative, the State of Wisconsin has pursued detailed studies of key segments of the Chicago–Milwaukee–Twin Cities spoke. The other affected States have participated in studies pertaining to the spoke as a whole. Wisconsin continues to serve as the lead state in the nine state Midwest Regional Rail Initiative.

#### *Outlook*

*Milwaukee–Madison segment.* Wisconsin is completing its environmental assessment and preliminary engineering work for 110 mph service in the Milwaukee to Madison corridor. An request for qualifications and proposals has been issued for a public-private venture to rehabilitate and improve the Milwaukee Amtrak station. The FY 2002 FRA Budget contains \$2.5 million for the General Mitchell International Airport rail station project in Milwaukee, and \$2 million for positive train control activities.

Indiana and Ohio (Chicago Hub Network: spokes between Chicago–Indianapolis–Cincinnati/Louisville; Chicago–Toledo–Cleveland; Cleveland–Columbus–Cincinnati)

This year, Ohio announced a \$200 million grade crossing initiative to treat its major grade crossing issues. Chicago's Environmental Law and Policy Center and Indiana's High Speed Rail Association have acted as a key spokespersons for high- speed rail efforts in the Midwest.

### **Gulf Coast Corridor (Louisiana, Mississippi, Alabama, Texas)**

*Accomplishments and Status:* On November 18, 1998, acting under Section 1103(c) of TEA-21, the Secretary of Transportation formally designated the Gulf Coast High-Speed Rail Corridor linking New Orleans, Louisiana with Houston, Texas; Mobile, Alabama; Meridian, Mississippi; and Birmingham, Alabama. The States are aiming to upgrade existing rail lines to

110 mph service and are preparing a strategic plan. Amtrak has provided \$1 million to the planning effort. In addition, Louisiana received a \$1 million earmark for high priority projects in FY 1999; \$1.85 million of Section 1103(c) funding was made available for the corridor for crossing hazard elimination.

*Outlook.* Planning and grade crossing activities will predominate in the immediate future as the Gulf Coast Corridor fulfills the prerequisites for proposed future investments. In Fiscal Year 2002, \$2 million was earmarked for grade crossing hazard elimination for the Gulf Coast Corridor. The Southern Rapid Rail Transportation Commission (consisting of representatives from Alabama, Mississippi, Louisiana and Texas) has taken the lead in planning efforts.

### **Southeast Corridor**

**(As Originally Designated: Washington, D.C.–Richmond, Va.–Raleigh, Greensboro, and Charlotte, N.C.)**

Virginia and North Carolina have completed a high-speed study for the Southeast Corridor, for which the FRA's study (*High-Speed Ground Transportation for America*) projected relatively strong performance due to the expected high volume of profitable through traffic over the Northeast Corridor.

North Carolina has been working with Virginia, South Carolina and Georgia to extend high-speed rail from Washington D.C.---first to Richmond, Raleigh and Charlotte, then Charlotte to Atlanta/Macon and finally from Raleigh to Columbia, Savannah and Jacksonville. The two states have created the Virginia North Carolina High Speed Rail Commission to provide legislative oversight for the project.

The States of Virginia and North Carolina, together with the FHWA and FRA, have prepared a draft Tier I Environmental Impact Statement for the Southeast Corridor and have recently begun a series of public outreach meetings. The second study phase - Tier II - will include more specific analysis and evaluate the impacts of track location, station arrangement and final design. The Tier II studies may take anywhere from a few months to several years to complete. Once completed, these studies will be used to acquire the permits needed for construction.

Activities thus far in each of the States of the originally designated Southeast Corridor are described below.

### **Virginia**

*Accomplishments and Status.* With the assistance of the Commonwealth, the railroads, and other interested parties, Amtrak and FRA collaborated on a detailed investigation of the fixed plant improvements that would provide reliable, 2-hour service between Union Station, Washington, and a revitalized and reopened Main Street Station in the heart of Richmond. Amtrak's *Report to Congress: Potential Washington–Richmond Improvements* was completed in May 1999. The study's prime conclusion is that such expedited, center-to-center service is

possible on a reliable basis, without adverse effects on commuter and freight services, provided that a staged program of carefully targeted and adroitly designed improvements to the infrastructure is methodically pursued.

Former Governor Gilmore made high-speed rail an integral part of his Northern Virginia transportation package. For Fiscal Year 2001, the Commonwealth's legislature approved a total of \$65.7 million for high-speed rail in the Richmond-Washington corridor as a down payment towards fully upgrading the line. The City of Richmond now owns Main Street Station and has set in motion a three-phase \$30 million renovation of the downtown station that could result in its reopening this year.

Virginia completed a study on upgrading the signal and communications systems on the rail corridor from Washington, D.C. through Richmond to Charlotte, N.C. The study recommends improvements to the signal system which will accommodate increased frequencies and speeds for passenger trains.

The State conducted a I-64 Major Investment Study (MIS) between Richmond and Newport News which included a comprehensive analysis of intercity rail alternatives. The Locally Preferred Alternative has been adopted by the Richmond MPO, the Hampton Roads MPO and the Commonwealth Transportation Board. The study recommends the widening of I-64, but it also recommends that rail service be upgraded by double tracking the existing CSX rail line, increase passenger train speeds to 110 mph, and increase frequencies to 8 round trips per day. The total cost of the proposed rail improvements is \$245 Million.

The Department has hired a consultant to investigate the feasibility of running high speed rail between Richmond and South Hampton Roads via Petersburg and the U.S. Route 460 corridor. This study is currently underway and is expected to be completed by early 2002.

*Outlook.* The Richmond-Washington corridor has the highest priority for high-speed rail in Virginia, and improvements will benefit both intercity rail service and commuter rail service provided in Northern Virginia by the Virginia Railway Express (VRE). The Commonwealth's Transportation Board recently announced support for a six stage high-speed rail plan for the Richmond to Washington portion of the corridor although financing for the entire \$348 million project has not been obtained. The Commonwealth's goal is to upgrade the corridor to provide sufficient additional capacity to accommodate projected expansion of intercity and commuter service, and to increase maximum speeds to 110 mph—from the current 70 mph—so that 90 minute downtown-to-downtown service can be provided.

## **North Carolina**

*Accomplishments and Status.* The State has asserted its control over the North Carolina Railroad and has recently negotiated an agreement with the Norfolk Southern for upgrades while embarking on an ambitious grade crossing protection plan for the state.

The State has developed a “sealed corridor initiative” for the Charlotte to Durham and Cary to Raleigh segments of the high-speed corridor from Raleigh to Charlotte. The purpose of the initiative is to increase safety by closing redundant crossings and providing the appropriate treatment for crossings in the entire corridor. These treatments cover 168 public crossings. The entire Raleigh to Charlotte corridor (174 miles) has 191 public crossings. The work includes (1) installation of grade crossing monitoring and data collection devices; (2) innovative grade crossing devices at public at-grade crossings; (3) video enforcement of warning devices at crossings; (4) studies and interviews to determine behavioral aspects and demographics of violators; (5) traffic separation studies to determine crossing consolidation opportunities; (6) and innovative warning devices at private crossings. A statistical evaluation of efforts completed to date indicates that five lives have already been saved.

*Outlook.* Between 2000 and 2005, the State is planning to spend about \$210 million in the Raleigh to Charlotte corridor; this amount includes participation that the State expects from partners.

### **Southeast Corridor Extensions**

Since its original designation, the Southeast Corridor has also been extended east from Richmond to Newport News; south from Raleigh to Columbia, S.C., Savannah, Ga., and Jacksonville, Fla.; and southwest from Charlotte, N.C. to Atlanta and Macon, Ga., with a connection between Atlanta/Macon and Savannah/Jacksonville..

The State of South Carolina has participated in securing the extension of the Southeast Corridor over well-established north/south rail passenger routes via Greenville (Norfolk Southern) and Columbia (CSX Transportation, former Seaboard Air Line). In addition, Amtrak provides passenger service over a third major north-south rail route in the State (CSX Transportation, former Atlantic Coast Line corridor via Charleston). South Carolina has also expressed interest in a possible east-west corridor between Atlanta and Charleston.

Georgia also participated in securing Southeast Corridor extensions that would serve Atlanta and Macon as well as Savannah. With \$250,000 in TEA-21 high-speed rail grade crossing funds, the State of Georgia is evaluating the crossings on its designated lines and developing appropriate improvement plans that will prioritize closures, consolidations, separations, and upgrading efforts.



The Atlanta to Macon portion of the corridor is a high priority for Georgia for commuter rail into Atlanta. Studies have been undertaken and preliminary engineering has been completed.. The state is now negotiating for the purchase of the line from Norfolk Southern.

Work is also underway on the return of passenger trains to an intermodal facility on the downtown Atlanta site of the former Terminal Station. The State is negotiating with Norfolk Southern for the purchase of the property. A plan for the new station and finding of no significant impact from the environmental review has been obtained. The state is seeking financing alternatives to construct the station.

## **Florida**

*Accomplishments and Status.* On November 7, 2000, Florida voters approved an amendment to the Florida Constitution directing the State Legislature, Governor and Cabinet to proceed with the development of a high speed ground transportation system. This system is required to use effective and efficient technologies capable of operating at speeds in excess of 120 miles per hour and must consist of dedicated rails or guideways separated from motor vehicular traffic. The Amendment also dictates that the system must ultimately link the five largest urban areas of the State and that construction must begin by November 1, 2003. At the 2001 regular legislative session, the Florida Legislature enacted the Florida High Speed Rail Authority Act. This Act created a nine- member High Speed Rail Authority. The Authority is charged with planning, administering and managing the preliminary engineering and preliminary environmental assessment of the intrastate high speed rail system. The Act also requires that the first segment of the system be developed and operated between St. Petersburg, Tampa and Orlando with future service to Miami. \$4.5 million in State funds were appropriated to the Authority for the purpose of performing its duties under the act in the current fiscal year.

*Outlook.* The High Speed Rail Authority's recently submitted report said that the first leg of the mandated statewide high-speed train system should run from Tampa to Orlando and construction can begin by next year's deadline. The report also recommended that the second leg should run from St. Petersburg to Tampa and construction should begin in 2005. All decisions remain with lawmakers. The report is merely a recommendation dependent on funding from the legislature

The cost of the first leg, which would begin running in 2007, is estimated to range from \$1.2 billion to more than \$6 billion depending the technology employed and the maximum operating speeds. The report stated that, if the State is to meet its November 2003 construction deadline, the system will have to be built either along Interstate 4 or on an existing railroad right-of-way. While private money can be used to run a high-speed train, some public money will have to be invested to build the facility, according to the report. But, it asserted, that has been the case with every kind of transportation to date: highways, bus systems, airports and seaports.

The FRA's FY 2002 budget contains an earmark for \$3 million to continue planning activities for the Florida High Speed Rail Authority.

### **Empire Corridor: New York City–Albany–Buffalo/Niagara Falls, New York**

*Accomplishments and Status.* Although only recently officially designated as “high-speed” under TEA-21, New York’s Empire Corridor has a heritage of high-speed operation that dates back to the 19<sup>th</sup> Century. Improvements supported by the State of New York since the 1980s have made possible operations at up to 110 mph on the Albany–New York portion of the route, which is one of the Nation’s outstanding examples of improved intercity passenger service outside the Northeast Corridor main line. The “RTL” turbine-powered equipment—remanufactured in a public/private partnership in which the State, the FRA, and Amtrak have participated—has helped to make possible the line’s noteworthy performance.

*Outlook.* New York State and Amtrak together plan to re-equip and incrementally improve the 160 mile New York to Schenectady line for up to 125 mph service, and to upgrade the line west of Schenectady to Buffalo/Niagara Falls. The State and Amtrak developed a \$185 million plan (\$140 million for plant improvements/\$45 million for equipment rebuilding) to reduce travel time (New York City–Albany in two hours; Albany–Buffalo in six and one half hours) in the corridor. In addition, the State is also actively involved in an effort to relocate Amtrak’s Empire and NEC operations to a new station in the U.S. Postal Service’s Farley Building in New York City.

A five-year grade crossing improvement plan (estimated at \$9.3 million) is also being instituted in the Empire Corridor which will close 15 crossings, construct five highway and two pedestrian bridges, upgrade five crossings and install locked gates at six private crossings. New York State DOT and FRA are also cooperating to test new grade crossing technologies and to implement improved grade crossing warning systems on the corridor.

### **Keystone Corridor (Pittsburgh–Philadelphia, PA, with through service to New York City)**

*Accomplishments and Status.* The Keystone Corridor is electrified between Harrisburg and Philadelphia, is almost completely grade-separated from the highway grid, and enjoys direct track access to Center City Philadelphia and, via the Northeast Corridor Main Line, to Midtown Manhattan. Thus, the Harrisburg–Philadelphia portion of the Keystone Corridor has for many decades been one of the Nation’s most highly developed and best-served intercity rail passenger routes, although formal recognition as a “designated high-speed corridor” came only with TEA-21. In recent years, Amtrak (the line’s owner and manager) has invested over \$30 million in remedying deferred maintenance on the 104-mile Harrisburg–Philadelphia portion.

The State is proposing to eliminate the remaining three public highway grade crossings on the Harrisburg to Philadelphia portion, and FRA allocated \$500,000 in 1999 to begin preliminary design for the grade separation and bypass road needed to eliminate these three crossings. This design work will be completed in 2002.

*Outlook.* The Pennsylvania Department of Transportation, FRA and Amtrak have recently studied the infrastructure needs and the potential uses of the Harrisburg to Philadelphia portion of the Keystone Corridor. The preliminary study conclusions suggest that the Amtrak owned line can indeed support the Commonwealth’s goal of a 90-minute travel time between Harrisburg and Center City Philadelphia, as well as direct, high-speed service between Harrisburg, Philadelphia’s western suburbs, and New York City.

Accordingly, the Commonwealth and Amtrak have agreed to undertake an aggressive five-year capital investment program in the corridor worth \$140 million, shared 50/50 by Amtrak and the Commonwealth. This partnership will lead to the acquisition of all-electric equipment capable of linking Harrisburg with the urban centers of Philadelphia and New York (non-electric equipment cannot use the tunnels leading to the best-located stations in those cities). Also, the partnership between Amtrak and Pennsylvania will support track and tie replacements, communications and signaling upgrades, catenary and electrification work, structure repairs and station improvements..

### **New High-Speed Rail**

The United States has no operating examples of new high-speed rail. Although such projects were proposed in several regions (Southern California, Texas, Florida) in the last decades of the 20<sup>th</sup> Century, financing and other difficulties have prevented their realization thus far. Nevertheless, the success of new high-speed rail in Europe and Japan, coupled with the high and growing population density of many regions of the United States, suggests that this HSGT option may continue to merit inclusion in HSGT alternatives studies in applicable regions of the United States.

### **Maglev**

In 1998 Congress passed the “Transportation Equity Act for the 21<sup>st</sup> Century” making available more than \$218 billion over a six year period for surface transportation assistance to states and localities. Section 1218 of this Act created a National Magnetic Levitation Transportation Technology Deployment Program. The program is administered by the FRA. The program was to demonstrate high speed maglev technology in commercial service through a project of about 40 miles in length, with a view toward assessing its potential applicability to longer-distance intercity corridors.

As provided in Section 1218, federal funding consisted of \$55 million for preconstruction planning to identify the most promising project through a competitive process , and up to an authorized (but not appropriated) \$950 million for final engineering and construction of the guideway of the one selected project. The Federal funds for planning and construction are to be matched 1/3 to 2/3 by state, local, or private contributions. To be eligible for Federal construction funding, if any, each project must demonstrate that operating revenues would exceed operating costs, and total benefits will exceed total costs over a 40-year period.

Applications for projects were solicited from States or their designated authorities, and in May 1999 seven projects were selected to participate in a one-year program of preconstruction planning needed to identify the most promising project. Sponsors of these projects were given planning grants.

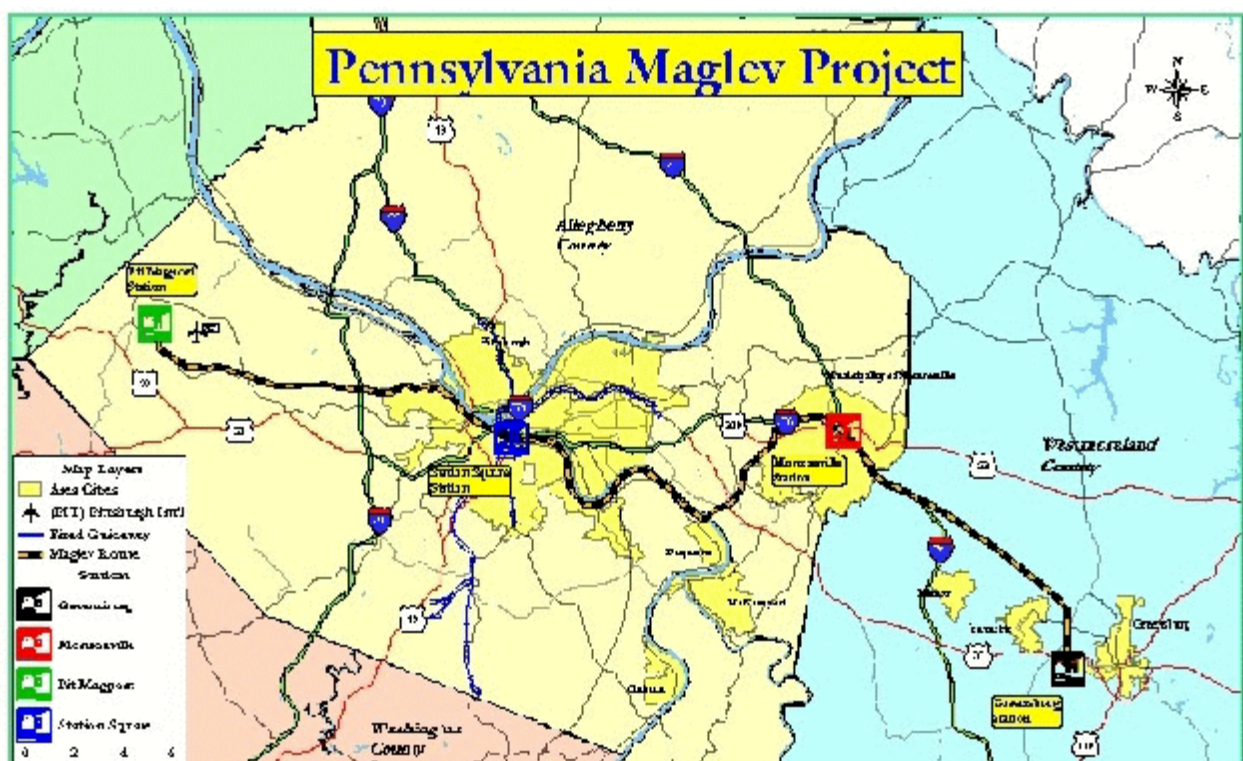
Project Descriptions from the seven competing States were submitted to the FRA on June 20, 2000, for review by a multi-disciplined selection review committee. From these seven competitors, the Secretary of Transportation selected two potential Projects to continue to the next stage of the program: a route between Baltimore, BWI Airport, and Washington, submitted by the State of Maryland; and Pennsylvania’s proposed system serving downtown Pittsburgh and the Pittsburgh Airport.

A Final Programmatic Environmental Impact Statement was published and distributed on April 20, 2001 that selected the “action alternative” to continue the program as the preferred alternative (subject to the availability of funds), and identified the Maryland and Pennsylvania projects for continued evaluation and project development. The Secretary of Transportation may

select one of these projects for possible design and construction based upon more detailed information. Proceeding to the construction phase is contingent upon Congressional appropriations and completion of a site-specific Environmental Impact Statement for the selected project.

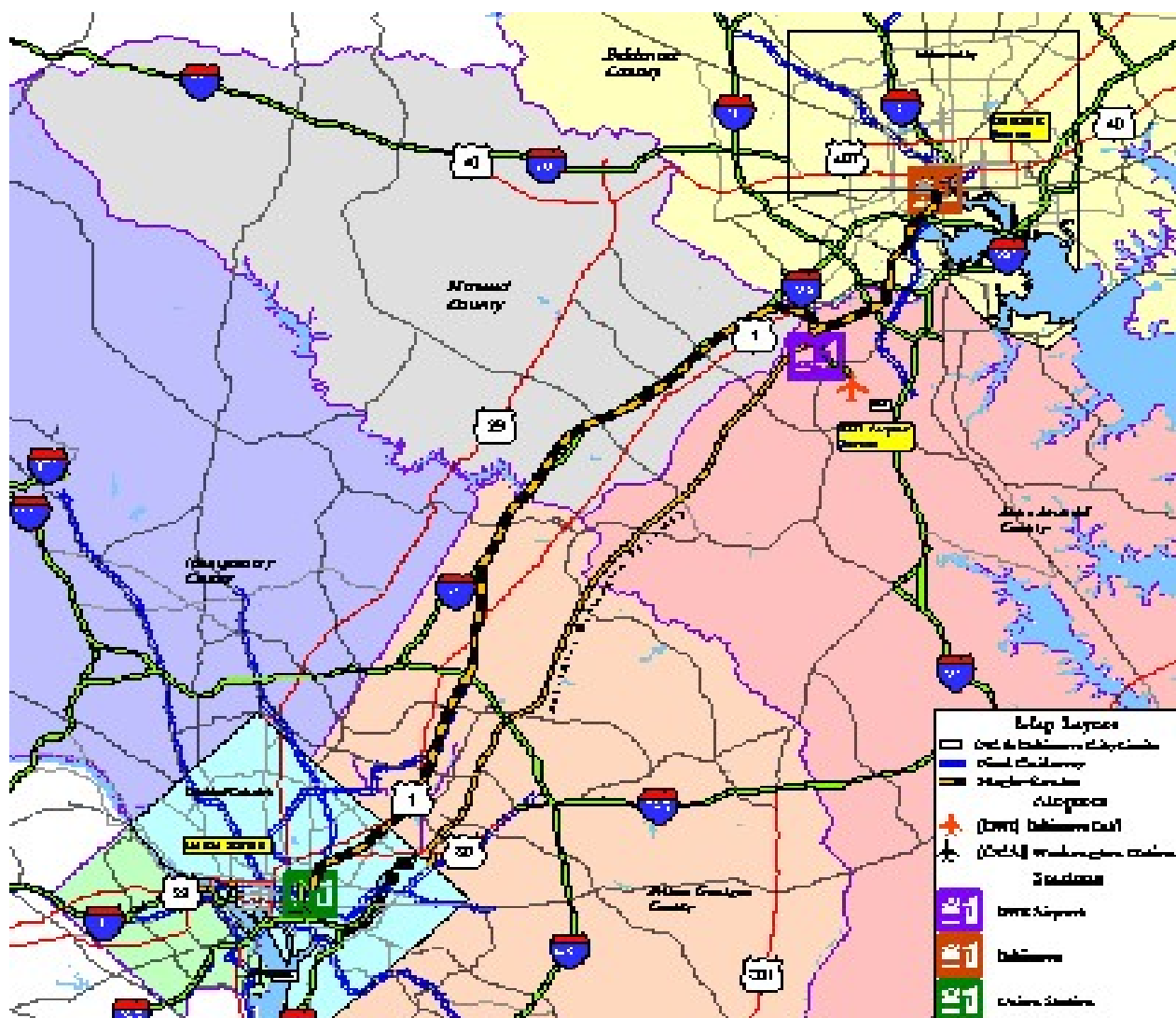
Following are descriptions of the two competing projects, both of which are based on application of the Transrapid maglev technology. These descriptions are based on the applicants' claims and do not necessarily reflect the views of the Federal Railroad Administration and the Department of Transportation.

**\$Pittsburgh, Pennsylvania:** A 76 kilometer (47-mile) project linking Pittsburgh Airport to Pittsburgh and its eastern suburbs. The project has been under study since 1990 and has two objectives. One is to demonstrate the first high-speed maglev project in the U.S. The other is to establish the precision fabrication technology to implement maglev technology anywhere in the U.S. The rugged physical terrain, a full four-season climate, and stops at an airport, downtown and in the suburbs would demonstrate the full potential of maglev technology to provide service in a variety of environments. The project is intended to be the first stage of a system that would eventually provide high-speed intercity service to Cleveland on the west and Philadelphia on the east. For more information on the Pennsylvania maglev project visit [www.ridegold.com](http://www.ridegold.com) or [www.maglevpa.com](http://www.maglevpa.com)



**\$Baltimore, Maryland to Washington DC:** A 64 kilometer (40-mile) project linking Camden Yard in Baltimore (a sports complex and center for recreation and tourism) and Baltimore-Washington International (BWI) Airport to Union Station in Washington, D.C. This project has been under study since 1994. Preliminary studies indicate the project would serve between 20,000 and 40,000 trips per day, even with continued Amtrak service in the corridor. It would provide residents and visitors to Washington DC with a second airport only 15 minutes from Union Station and take some of the pressure off Reagan National Airport which has historically operated at capacity with rationing of gate slots. The project is visualized as the initial stage of a high-speed maglev system that would serve the entire Northeast Corridor between Boston and Charlotte, NC. In the event the Baltimore-Washington area wins its bid for the 2012 Olympic designation, the system would provide rapid transportation between the sports venues in both cities and the airport.

The two project teams shared about \$14.2 million in FY 2001 federal funding, matched by \$7.1 million, to refine proposed plans, estimates of ridership and revenues, and environmental analysis, and to secure financial commitments. Subject to the



availability of funds, the information generated in this process would enable the Department to make a well informed selection of a project and would form the basis for the site-specific Environmental Impact Statement (EIS) regarding the selected project. It is anticipated that early in 2003, the Department could be in a position to select a single project and, later that year, upon completion of the EIS, to make the decision whether or not to go ahead with construction.

Although not selected to participate in the next phase of the Maglev Deployment Program, the projects in California, Florida, Georgia, Louisiana, and Nevada were encouraged to continue to develop their plans and seek alternative sources of financing. To assist them, FRA has made available almost \$1 million in federal funds for each of the projects, as specified by Congress in the FY2001 Appropriation Act.

Currently, the FRA is administering the planning grants and monitoring the work of each of the project sponsors. In addition, since maglev comes under the jurisdiction of the Federal Railroad Safety Act, FRA must approve the design and operational plan for any maglev project through FRA's safety rule-making process. As necessary and appropriate, FRA will analyze project designs and plans from a safety assurance viewpoint. Since the Federal Republic of Germany has already conducted a similar process with regard to implementation of the same Transrapid maglev technology in Germany, the Department has signed an agreement with its counterpart department in Germany to share safety-related information.

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